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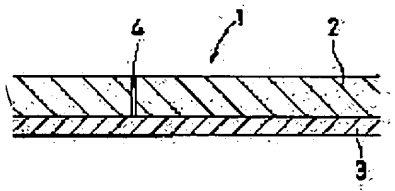
(54) PACKAGING MATERIAL WHICH CAN RELEASE INTERNAL PRESSURE

(57)Abstract:
PROBLEM TO BE SOLVED: To enable internal pressure to be released at the time of heating by a microwave oven or the like by providing a breaking layer of specific thickness and relatively weak fracture strength on a heat seal layer, fusing this to a part of a base material or the heat seal layer, and providing an internal pressure release port reaching the breaking layer.
SOLUTION: In the packaging material 1 comprising a heat seal layer 3 laminated on a heat-resistant material 2, an internal opening port 4 with an end opened on an external face of the base material 2 and the other end reaching at least the heat seal layer 3 is provided, and a braking layer with a fusing interface approximately coinciding with an end of the internal opening port 4 and made of thermoplastic synthetic resin having relatively weak fracture strength as thick as 5 to



30 μm is provided on the heat seal layer 3. The heat seal layer 3 may comprise an external breaking layer and an internal resin layer fused thereto, while the internal pressure opening port 4 may be from the base material 2 through the internal resin layer. The external breaking layer is preferably formed of one of low density polyethylene, ethylene-vinyl acetate copolymer, ionomer or the like.

* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] The packing material to which a welding interface is characterized by having opened the end wide on the external surface of said base material, having prepared the internal pressure clear aperture to which the other end reaches said heat-sealing layer at least in the packing material which carried out the laminating of the heat-sealing layer to the heat-resistant base material, and the thickness to external surface preparing the fracture layer which is 5-30 micrometers in said heat-sealing layer almost in accordance with the other end of this internal pressure clear aperture and in which internal pressure disconnection is possible.
[Claim 2] The packing material which was indicated by claim 1 characterized by consisting of two-layer [of the inside resin layer by which welding of said heat-sealing layer was carried out to an outside fracture layer and this], and said internal pressure clear aperture **(ing) from said base material to an outside fracture layer mostly and in which internal pressure disconnection is possible.
[Claim 3] said fracture layer -- low density polyethylene and a line -- the packing material which consists of low density polyethylene, an ethylene-vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, or the ionomers and in which internal pressure disconnection according to claim 1 or 2 is possible.
[Claim 4] said inside resin layer -- low density polyethylene and a line -- the packing material which are low density polyethylene, an ethylene-vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, or the ionomers and in which internal pressure disconnection according to claim 1 or 2 is possible.
[Claim 5] The packing material which said internal pressure clear aperture cuts and consists of an eye or a stoma and in which internal pressure disconnection according to claim 1 to 4 is possible.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] When this invention heats a package object with a microwave oven etc., it relates to the packing material which enabled it to open internal pressure automatically.
[0002]
[Description of the Prior Art] If refrigeration, refrigerated food, etc. are heated with a microwave oven with the condition of having carried out the seal package, the moisture contained in food will become a steam, internal pressure will go abruptly up, and ******** will explode at last. Therefore, food is picked out from a package object and it removes to another heat-resistant container, and it wraps in a wrap film, or the lid is put and heated. This is time-consuming actuation which lacks in convenience.
[0003] Then, a package object is formed with a heat-resistant film or a sheet, and how to cut a package object with scissors etc. and to prepare opening at the time of heating is considered. However, this not only also requires time and effort, but there may be no convenience like scissors close by. On the other hand, opening some package objects wide beforehand in a manufacture phase is performed, and the contents which sealing performance packs [which pack and disadvantage-break] will also be limited. Therefore, there is a method of closing with the label the internal pressure clear aperture prepared beforehand, exfoliating a label in the case of heating, and opening the clear aperture wide. However, this also has the problem which the excessive process closed with a label joins.
[0004] Therefore, the superposition tape which prepares the part with weak bond strength in the heat seal section of a package object, or bond strength is weak and is easy to divide into two is inserted, and when internal pressure increases with heating, there are some which a part with weak bond strength exfoliates automatically, and opening is formed, and opened internal pressure. However, since a part with weak bond strength is in the heat-sealing section even if partial, uniform and strong sealing performance cannot be expected, but a pouch like a bag body is formed further beforehand, and it is necessary to take the process which fills this up with contents, and is not fit for the pyro package which follows coincidence and performs package and restoration. And the approach of inserting a tape has the problem which becomes structurally complicated and leads to the increase of cost.
[0005] In addition, what carried out the laminating of the low-melt point point resin film to the base material which prepared the air hole as heat seal material, considered as lid material, and carried out the heat seal of this to the container is known. It will liquefy, if a low-melt point point resin film reaches the melting point with heating, and it is pushed up to an air hole part by internal pressure, and the penetrated air hole is formed. However, when a low-melt point point film fuses, seal reinforcement becomes weak and there is a problem that sealing performance is spoiled. Moreover, since it is located in the innermost layer which touches contents directly, a low-melt point point film will be attached [which this layer fuses] as fly, and it adheres to contents or it also has a possibility that the additive of a low-melt point

point film may melt, and the aroma and the taste of broth contents may be spoiled.
[0006] moreover, the above -- also in which internal pressure disconnection approach, there is a problem that control of whenever [stoving temperature / at the time of internal pressure disconnection] is very difficult.
[0007]
[Problem(s) to be Solved by the Invention] Then, the technical problem of this invention can be heated with a microwave oven, with food packed, and has neither a burst nor scattering of contents, and the temperature control of internal pressure disconnection can also be easy, contents can be packed airtightly completely without a non-seal part, it can respond to any package gestalt of a pyro package or a pouch package, and productivity is offering a high packing material cheap also in cost.
[0008]
[Means for Solving the Problem] In the packing material to which this invention carried out the laminating of the heat-sealing layer to the heat-resistant base material in order to solve the above-mentioned technical problem An end is wide opened on the external surface of said base material, and the internal pressure clear aperture to which the other end reaches said heat-sealing layer at least is prepared. A welding interface is characterized by the thickness to external surface preparing the fracture layer which consists of thermoplastic synthetic resin with the comparatively weak breaking strength which is 5 micrometers - 30 micrometers in said heat-sealing layer almost in accordance with the other end of this internal pressure clear aperture.
[0009] It can consist of the inside resin layer by which welding of said heat-sealing layer was carried out to an outside fracture layer and this, and said internal pressure clear aperture can be made to penetrate from said base material to an inside resin layer.
[0010] said outside fracture layer -- low density polyethylene and a line -- it is desirable to form by low density polyethylene, an ethylene-vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, or the ionomers.
[0011] Moreover, as for said inside resin layer, it is desirable to form with thermoplastic synthetic resin homogeneous as an outside fracture layer.
[0012] Said internal pressure clear aperture consists of an end eye or a stoma.
[0013]
[Function] Said fracture layer consists of a resin layer with comparatively weak breaking strength, and except the part of an internal pressure clear aperture, since it is welding to a part of base material or heat-sealing layer, a weak spot part, a part for i.e., the fracture layer corresponding to an internal pressure clear aperture, fractures it by internal pressure rise.
[0014]
[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained based on an accompanying drawing.
[0015] Drawing 1 shows the example from which the heat-sealing layer itself is a fracture layer. Like illustration, a packing material 1 consists of the heat-resistant base material 2 and the heat-sealing layer 3, and the internal pressure clear aperture 4 which penetrates a base material 2 is formed in the base material 2. The end eyes 4b, 4c, and 4d of the shape of "+" besides end eye 4a of the linear "-" configuration as shown in drawing 2 , "x", and a "U" typeface are sufficient as the internal pressure clear aperture 4, or stoma 4e is sufficient as it. The configuration of stoma 4e may not be restricted circularly [illustration], but the anomaly of a polygon and others is sufficient as it. Although especially a limit does not have the magnitude of an end eye or a stoma, it is about 2-5mm in the major axis of about 1-15mm and a stoma by the die length of an end eye. Of course, more than one may be prepared.
[0016] As a base material 2 with said thermal resistance, a synthetic-resin film with thermal resistance is common, in order to use with a microwave oven, especially, high thermal resistance is not required but a simple substance or complex, such as biaxial extension polypropylene, 1 shaft extension high density

polyethylene, biaxial extension polyester, and a biaxial extension polyamide, are used. In addition, paper and a metallic foil may be used and it will be necessary to make it complex for the reason mentioned later especially in this case. Of course, a printing layer can be prepared.

[0017] The heat-sealing layer 3 as said fracture layer can be first welded to said base material 2. It has compatibility in **, and it has the property homogenized to ** in a junction interface, the bond strength in a junction interface becomes very large, and welding means that the heat-sealing layer 3 (fracture layer) is firmly supported by the base material 2 here. Next, it must fracture comparatively easily with internal pressure. as such synthetic resin -- low density polyethylene and a line -- there are low density polyethylene, an ethylene-vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, an ionomer, etc., and thickness is 5 micrometers - about 30 micrometers. Of course, since damaging by the impact at the time of the handling by a circulation process etc. must avoid, 5 micrometers or more of fracture by internal pressure rise will become difficult, if it is required and 30 micrometers is exceeded. Although such a heat-sealing layer 3 is formed of the usual roll coat, an extrusion coat, a heat lamination, etc., the resin layer which can be welded to an opposed face with the heat-sealing layer 3 of a base material 2 is required for it. As such resin, the same resin as said heat-sealing layer 3 is chosen. You may not be the same resin as long as weld is possible, of course.

[0018] By the way, in order to raise the sealing performance of package objects, such as a container and a bag, it will be necessary to enlarge seal reinforcement of a lid and a container flange. For that purpose, the thickness of a heat-sealing layer must be secured to some extent above. weakening breaking strength on the other hand, in order to open internal pressure easily -- that is, it is necessary to make a heat-sealing layer thin as much as possible Thus, obtaining required seal reinforcement and moderate fracture strength is a concept which carries out phase conflict. Then, as shown in drawing 3 , the inside resin layer 31 of said heat-sealing layer 3 is formed in the inside of a base material 2 through adhesives for dry laminations like 2 liquid hardening mold urethane system resin, or the anchor coat layer 21, and the internal pressure clear aperture 4 is formed in it at this layered product. And the outside fracture layer 32 is formed in this inside resin layer 31. layers 31 and 32 -- low density polyethylene and a line -- low density polyethylene, an ethylene-vinylacetate copolymer, polypropylene, an ethylene-acrylic-acid copolymer, an ionomer, etc. may be used, and you may not be the same resin as long as weld with ** is possible. If it is [the thickness of the inside resin layer 31] sufficient if the outside fracture layer 32 can be held to a base material 2 with sufficient bond strength, and there are 5 micrometers - 40 micrometers, it is enough. Moreover, the thickness of the outside fracture layer 32 is about 5-30 micrometers as mentioned above. In addition, the laminating of the inside resin layer 31 is carried out to a base material 2 with other adhesives, and also, of course, a direct laminating may be carried out.

[0019] Thus, while sufficient thickness is securable by making the heat-sealing layer 3 two-layer [of the inside resin layer 31 and the outside fracture layer 32], since the internal pressure clear aperture 4 is attained to the thin fracture layer 32 and is welding the fracture layer 32 to the inside resin layer 31, it fractures the fracture layer 32 easily by internal pressure rise. That is, it becomes possible by making the heat-sealing layer 3 into two-layer structure, and choosing suitably the thickness of the inside resin layer 31 and the outside fracture layer 32 to control seal reinforcement and breaking strength with sufficient balance.

[0020] An example is given to below.

[0021]

[Example 1] The coat of the 2 liquid reaction type urethane system anchor coat (Takeda Chemical Industries bamboo rack A3210) was carried out to 12-micrometer polyester film (Toyobo make E5101) as heat-resistant plastic film, and on it, 30-micrometer extrusion coat of the low density polyethylene (Sumitomo Chemical SUMIKASEN L-705) was carried out, and it formed with the long sheet. After aging this in a 40-degree C ambient atmosphere for 24 hours, by the rotary knife, it cut endlessly at intervals of about 50mm, the eye was put in, and 8-10-micrometer extrusion coat of the polyethylene

still more of the same kind was carried out. The frozen steamed meat dumpling which put on the tray made from polypropylene by this packing material was heated with the package and the microwave oven of 500W to saccate. The package object swelled in about 50 seconds, the steam fell out from the place of an end eye, and it did not result in a burst.
[0022] In addition, the configuration of an end eye was made into "-", "+", and "x", and prepared about each three kinds whose die length of one side is 3mm, 5mm, and 10mm.
[0023]
[Example 2] The same packing material as an example 1 was prepared, and 200g water was enclosed with the flat bag of the method seal with a size [of 150x180mm], and a seal width of 10mm of four. Three sorts of bags which prepared the end eye (only a base material is penetrated) of the shape of "-(die length of 3mm, 5mm, and 10mm)" in the center of a longitudinal direction of a flat bag were prepared. When it made a concrete above the floor level carry out natural fall of these 10 times from a part with a height of 1m, there was no water leak from any bag.
[0024] When these bags were put on the pan made from earthenware and having been heated with the microwave oven of 500W, it cut in about 60 seconds and the steam blew off from the place of an eye.
[0025]
[Example 3] as heat-resistant plastic film -- a 15 micrometers biaxial extension nylon film (Unitika ONS) and a 30-micrometer line -- the lamination long picture sheet was formed for the low consistency polyethylene film (Rix L6102, Toyobo) with 2 liquid reaction type urethane system dry lamination adhesives. the rotary knife after aging this in a 40-degree C ambient atmosphere for 48 hours -- about 50mm spacing -- endless -- a break -- putting in -- further -- a line -- a low consistency polyethylene film side -- a 15-micrometer line -- the coat of the low density polyethylene (ULTZEX 1500C made from the Mitsui petrochemistry) was extruded and carried out. The frozen steamed meat dumpling which put on the tray made from polypropylene by this packing material was heated with the package and the microwave oven of 500W to saccate. The package object swelled in about 60 seconds, the steam fell out from the place of a break, and it did not result in a burst.
[0026] In addition, the configuration of a break was made into "-" and the die length prepared two kinds, 5mm and 10mm.
[0027]
[Example 4] 25 micrometers polyester film (Toyobo make E5101) and a 40-micrometer low consistency polyethylene film (Aicello Chemical make S-203) were formed in the lamination long picture sheet with 2 liquid reaction type urethane system adhesives (Takeda Chemical Industries bamboo rack A-310). After aging this, the break of "-" was put in with a die cut roll, and on it, 15-micrometer extrusion coat of the low density polyethylene (Sumitomo Chemical SUMIKASEN L-705) was carried out, and it considered as lid material. The break was deeply cut so that it might enter side by side with three pieces and the pitch of 50mm by die length of 15mm.
[0028] A polyethylene container (the product made from the Idemitsu petrochemistry, Magic top) is covered with absorbent cotton, 50g of water was infiltrated, the seal was carried out and the seal of said lid material was carried out so that a break might be located in a line in the center. The container was heated with the microwave oven of 500W for home use for 2 minutes. A steam continued rising [lid material] and emitting a steam with ejection and a swelling from the place of a break continuously in about 1 minute after heating.
[0029]
[Effect of the Invention] According to this invention, by preparing the fracture layer with comparatively weak breaking strength of specific thickness in a heat-sealing layer, welding this to a part of base material or heat-sealing layer as mentioned above, and preparing the internal pressure clear aperture which reaches this fracture layer, the internal pressure disconnection at the time of heating by a microwave oven etc. is attained, and a pyro package etc. becomes possible large cost reduction is not

only made, but, and the temperature or the pressure of internal pressure release can be controlled [coincidence / sealing performance and] easily.

[Translation done.]